# 5.3 Air Quality

The air quality analysis provided in this section is summarized from the air quality technical report titled "Air Quality Conformity Assessment, Dos Colinas Senior Community/Affordable Housing–Carlsbad CA, ISE Report #09-011" (ISE, May 19, 2009). This document is provided as Appendix C1 on the attached CD of Technical Appendices found on the back cover of this EIR.

## 5.3.1 Existing Conditions

### *5.3.1.1 Climate*

The climate of San Diego County is characterized by warm, dry summers and mild, wet winters and is dominated by a semi-permanent high-pressure cell located over the Pacific Ocean. This high-pressure cell maintains clear skies over the air basin for much of the year.

Within the City of Carlsbad the minimum and maximum average temperatures are 45 and 74 degrees Fahrenheit, respectively. Precipitation in the area averages 11.2 inches annually, 90 percent of which falls between November and April. Sunshine is common but night and morning cloudiness is common during the spring and summer. Fog can occur occasionally during the winter.

The prevailing wind direction is from the west-northwest, with an annual mean speed of 8 to 10 miles per hour. Occasionally during the months of October through February, offshore flow becomes a dominant factor in the regional air quality. These periods, known as "*Santa Ana Conditions*", are typically maximal in the month of December with wind speeds from the north to east approaching 35 knots. This air movement is caused by clockwise pressure circulation over the Great Basin, which results in significant downward air motion towards the ocean. Frequently, the strongest winds in the basin occur during the night and morning hours due to the absence of onshore sea breezes. The overall result is a noticeable degradation in local air quality.

### *5.3.1.2 Inversion*

The dominant semi-permanent high-pressure cell responsible for mostly clear skies in San Diego is also responsible for driving the onshore circulation that helps to create two types of temperature inversions, subsidence and radiation, that contribute to local air quality degradation.

Subsidence inversions occur during the warmer months, as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. This boundary between the two layers of air represents a temperature inversion that traps pollutants below it. Radiation inversion typically develops on winter nights, when air near the ground cools by radiation, and the air aloft remains warm. A shallow inversion layer that can trap pollutants is formed between the two layers.

### *5.3.1.3 Major Air Pollutants*

Air quality is defined by ambient air concentrations of specific pollutants determined by the Environmental Protection Agency (EPA) with respect to the public's health and welfare. The subject pollutants, which are

monitored by the EPA, are Carbon Monoxide (CO), Sulfur Dioxide ($SO_2$), Nitrogen Dioxide ($NO_2$), Ozone ($O_3$), respirable 10- and 2.5-micron particulate matter ($PM_{10}$), Volatile Organic Compounds (VOCs), Reactive Organic Gasses (ROG), Hydrogen Sulfide ($H_2S$), sulfates, lead, and visibility reducing particles.

Examples of sources and effects of these pollutants are identified below:

1. Carbon Monoxide (CO) – Carbon monoxide (CO) is a colorless, odorless, tasteless and toxic gas resulting from the incomplete combustion of fossil fuels. CO interferes with the blood's ability to carry oxygen to the body's tissues and results in numerous adverse health effects. CO is a criteria air pollutant.

2. Oxides of Sulfur ($SO_x$) – Oxides of sulfur ($SO_x$) typically are strong smelling, colorless gases that are formed by the combustion of fossil fuels. Sulfur dioxide ($SO_2$) and other sulfur oxides contribute to the problem of acid deposition. $SO_2$ is a criteria pollutant.

3. Nitrogen Oxides ($NO_x$) – Nitrogen oxides ($NO_x$) consist of nitric oxide (NO), nitrogen dioxide ($NO_2$) and nitrous oxide ($N_2O$) and are formed when nitrogen ($N_2$) combines with oxygen ($O_2$). Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. $NO_2$ is a criteria air pollutant, and may result in numerous adverse health effects.

4. Ozone ($O_3$) – Ozone is a product of the photochemical process involving the sun's energy. Ozone exists in the upper atmosphere ozone layer as well as at the earth's surface. Ozone at the earth's surface causes numerous adverse health effects and is a criteria air pollutant. It is a major component of smog.

5. Particulate Matter less than 10 microns ($PM_{10}$) – $PM_{10}$ is a major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the lungs where they may be deposited, resulting in adverse health effects. $PM_{10}$ also causes visibility reduction and is a criteria air pollutant.

6. Particulate Matter less than 2.5 microns ($PM_{2.5}$) – Air pollutant consisting of tiny solid or liquid particles which are 2.5 microns or smaller (often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include sulfates formed from $SO_2$ release from power plants and industrial facilities, and nitrates that are formed from $NO_x$ release from power plants, automobiles, and other types of combustion source. The chemical composition of fine particles highly depends on location, time of year, and weather conditions.

7. Volatile Organic Compounds (VOCs), Reactive Organic Gases, (ROGs) – Volatile Organic Compounds (VOCs) and Reactive Organic Gases (ROGs) are hydrocarbon compounds (any compound containing various combinations of hydrogen and carbon atoms) that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. ROG is similar to VOC and is also a precursor pollutant in forming $O_3$. ROG consists of compounds containing methane, ethane, propane, butane, which are typically the result of some type of

combustion/decomposition process. Smog is formed when ROG and $NO_x$ react in the presence of light.

8. Hydrogen Sulfide ($H_2S$) – A colorless, flammable, poisonous compound. It often results when bacteria break down organic matter in the absence of oxygen. High concentrations of 500-800 ppm can be fatal and lower levels cause eye irritation and other respiratory effects.

9. Sulfates – An inorganic ion that is generally naturally occurring and is one of several classifications of minerals containing positive sulfur ions bonded to negative oxygen ions.

10. Lead – A malleable metallic element. It is a toxic substance that can cause damage to the nervous system or blood cells.

11. Visibility Reducing Particles (VRP) – Small particles that occlude visibility and/or increase glare of haziness.

### *5.3.1.4 Regional and Local Conditions*

The project site is located in the northwestern portion of the San Diego Air Basin (SDAB). Figure 5.3-1 depicts the SDAB boundaries within Southern California. The Basin has a transitional-attainment status of federal standards for $O_3$. The Basin is either in attainment or unclassified for federal standards of CO, $SO_2$, $NO_2$, $PM_{10}$, and lead. The SDAB is also in attainment of state air quality standards for all pollutants with the exception of $O_3$ and $PM_{10}$.

Motor vehicles are the major generators of air pollutant emissions associated with the proposed project area. El Camino Real, Cannon Road, and College Boulevard carry substantial local and regional traffic emitting exhaust pollutants. Based upon the dispersion model findings, no localized criteria pollutant impacts were identified for any roadway segment examined.

#### A. Ambient Air Quality

The EPA (under the Federal Clean Air Act of 1970, and amended in 1977) established ambient air quality standards for specific pollutants. This standard is called the National Ambient Air Quality Standards (NAAQS). Individual states have the option to add additional pollutants, require more stringent compliance, or include different exposure periods, then adopt changes as their own state standards. The California Air Resources Board (CARB) subsequently established the more stringent California Ambient Air Quality Standards (CAAQS). Table 5.3-1 compares the California and federal ambient air quality standards. Areas in California where ambient air concentrations of pollutants are higher than the state standard are considered to be in "non-attainment" status for that pollutant, as is the case in the SDAB for $O_3$ and $PM_{10}$.

The California Air Resources Board (CARB) monitors ambient air quality at approximately 250 air-monitoring stations across the state. Ambient air pollutant concentrations in the SDAB are measured at 10 air-monitoring stations operated by the San Diego Air Pollution Control District (SDAPCD).


SOURCE: Teale GIS Solutions Group, 1999; BRG Consulting, Inc., 2010

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# Air District Boundaries

FIGURE 5.3-1

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# TABLE 5.3-1
## California and Federal Ambient Air Quality Standards

| Pollutant | Average Time | California Standards[1] | | Federal Standards[2] | | |
|---|---|---|---|---|---|---|
| | | Concentration[3] | Method[4] | Primary[3,5] | Secondary[3,6] | Method[7] |
| Ozone ($O_3$) | 1 Hour | 0.09 ppm (180 ug/m³) | Ultraviolet Photometry | —— | Same as Primary Standard | Ultraviolet Photometry |
| | 8 Hour | 0.070 ppm (137 ug/m³) | | 0.075 ppm (147 ug/m³) | | |
| Respirable Particulate Matter ($PM_{10}$) | 24 Hour | 50 ug/m³ | Gravimetric or Beta Attenuation | 150 ug/m³ | Same as Primary Standard | Inertial Separation and Gravimetic Analysis |
| | Annual Arithmetic Mean | 20 ug/m³ | | —— | | |
| Fine Particulate Matter ($PM_{2.5}$) | 24 Hour | No Separate State Standard | | 35 ug/m³ | Same as Primary Standard | Inertial Separation and Granvimetic Analysis |
| | Annual Arithmetic Mean | 12 ug/m³ | Gravimetric or Beta Attenuation | 15.0 ug/m³ | | |
| Carbon Monoxide (CO) | 8 Hour | 9.0 ppm (10 mg/m³) | Non-dispersive Infrared Photometry (NDIR) | 9 ppm (10 mg/m³) | None | Non-dispersive Infrared Photometry (NDIR) |
| | 1 Hour | 20 ppm (23 mg/m³) | | 35 ppm (40 mg/m³) | | |
| | 8 Hour (Lake Tahoe) | 6 ppm (7 mg/m³) | | —— | —— | —— |
| Nitrogen Dioxide ($NO_2$) | Annual Arithmetic Mean | 0.030 ppm (57 ug/m³) | Gas Phase Chemiluminescence | 0.053 ppm (100 ug/m³) | Same as Primary Standard | Gas Phase Chemiluminescence |
| | 1 Hour | 0.18 ppm (339 ug/m³) | | 0.100 ppm (see Footnote 8) | | |
| Lead[9] | 30 Days Average | 1.5 ug/m³ | Atomic Absorption | —— | —— | —— |
| | Calendar Quarter | —— | | 1.5 ug/m³ | Same as Primary Standard | High Volume Sampler and Atomic Absorption |
| | Rolling 3-month Average [10] | —— | | 0.15 ug/m³ | | |
| Sulfur Dioxide ($SO_2$) | Annual Arithmetic Mean | —— | Ultraviolet Fluorescence | 0.030 ppm (80 ug/m³) | —— | Spectrophotmetry (Pararosoaniline Method) |
| | 24 Hour | 0.04 ppm (105 ug/m³) | | 0.14 ppm (365 ug/m³) | —— | |
| | 3 Hour | —— | | —— | 0.5 ppm (1300 ug/m³) | |
| | 1 Hour | 0.25 ppm (655 ug/m³) | | —— | —— | —— |

# TABLE 5.3-1
## California and Federal Ambient Air Quality Standards (cont'd.)

| Pollutant | Average Time | California Standards[1] | | Federal Standards[2] | | |
|---|---|---|---|---|---|---|
| | | Concentration[3] | Method[4] | Primary[3,5] | Secondary[3,6] | Method[7] |
| Visibility Reducing Particles | 8 Hour | Extinction of coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07 – 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape. | | No Federal Standards | | |
| Sulfates | 24 Hour | 25 ug/m³ | Ion Chromatography | | | |
| Hydrogen Sulfide | 1 Hour | 0.03 ppm (42 ug/m³) | Ultraviolet Fluorescence | | | |
| Vinyl Chloride[9] | 24 Hour | 0.01 ppm (26 ug/m³) | Gas Chromatography | | | |

Notes:
(1) California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – $PM_{10}$, $PM_{2.5}$, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

(2) National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24 hour standard is attained when the expected number of days per calendar year with a 24 hour standard concentration above 150 µg/m³ is equal to or less than one. For PM 2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further classification and current federal policies.

(3) Concentrations expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25° C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

(4) Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

(5) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

(6) National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(7) Reference method as described by the EPA. An "equivalent method" of measurement may be used, but must have a "consistent relationship to the reference method" and must be approved by the EPA.

(8) To attain this standard, the 3-year average of t the 98$^{th}$ percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).

(9) The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementations of control measures at levels below the ambient concentrations specified for these pollutants.

(10) National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: California Air Resources Board (02/16/10)

The nearest air quality monitoring stations (Figure 5.3-2), with respect to the project site, are located north of the City of Oceanside (Camp Pendleton W. B Street station – ARB Station ID 80198) approximately 7.9 miles from the project site, and within the City of Escondido (East Valley Parkway station – ARB Station ID 80115) approximately 12.2 miles from the project site. The Escondido station currently records CO, $NO_2$, $O_3$, $PM_{10}$, $BAM_{PM2.5}$, $PM_{2.5}$, outdoor temperature, wind direction, and horizontal wind speed, while the Camp Pendleton station only measures $NO_2$, $O_3$, outdoor temperature, wind direction, and horizontal wind speed.

In general, Carlsbad and the coastal area enjoy good air quality with the exception of occasional exceedances of air quality standards for $O_3$ and $PM_{10}$. Table 5.3-2 depicts the ambient air quality summary for the Escondido and Camp Pendleton Monitoring Stations for 2006 through 2008. The Escondido air-monitoring station reported exceedances of the state standards for $O_3$ and $PM_{10}$ from 2006 through 2008. Federal standards were also exceeded for $O_3$ from 2006 through 2008. The federal and state standards for CO were not exceeded. The state standard for $PM_{10}$ was exceeded from 2006 through 2008, while the federal standard was not exceeded.

At the Camp Pendleton Monitoring Station, the state standard for $O_3$ was exceeded from 2006 through 2008, and the federal standard was exceeded in 2008. All other criteria pollutants were within both the state and federal standards. Monitoring for lead was discontinued entirely in 1998.

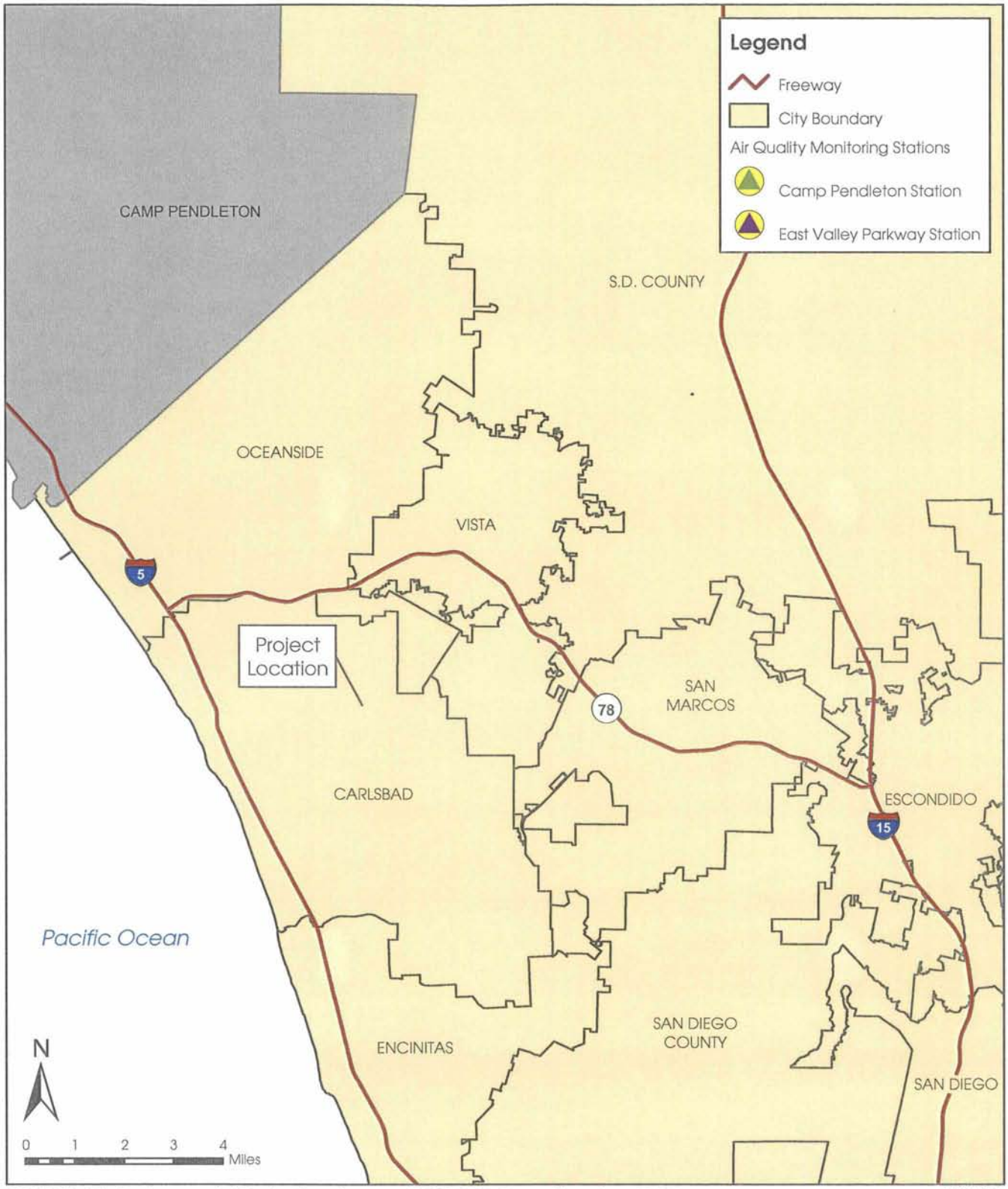
**B. Sensitive Receptors**

High concentrations of air pollutants pose health hazards for the general population, but particularly for the young, the elderly and the sick. Typical health problems attributed to smog include respiratory ailments, eye and throat irritations, headaches, coughing, and chest discomfort. Currently, no sensitive receptors such as schools, parks, hospitals, convalescent homes, or nursing homes are located within or in immediate proximity to the project site. However, the Rancho Carlsbad community, a majority of which is occupied by retired and/or elderly persons, is located immediately west of the CCRC and RV storage and garden site. In addition, The Terraces at Sunny Creek high density multi-family and single family developments are located to the east (immediately adjacent to site) and south of the proposed affordable housing site, respectively. The Carlsbad Unified School District (District) owns property, located approximately 0.12 miles northeast of the CCRC site at the northeast corner of Cannon Road and College Boulevard. The District is proposing a new high school at this location. The approved Cantarini Ranch and Holly Springs residential subdivisions are located generally to the north and east of the project site.

### *5.3.1.5 Regional Air Quality Strategy Plan*

The continued violations of NAAQS in the SDAB, particularly for $O_3$ in inland foothill areas, requires that a plan be developed outlining the pollution controls that will be undertaken to improve air quality. In San Diego County, this attainment planning process is embodied in the Regional Air Quality Strategies (RAQS) developed jointly by the Air Pollution Control District (APCD) and the San Diego Association of Governments (SANDAG).

A plan to meet the federal standard for $O_3$ was developed in 1994 during the process of updating the 1991 state-mandated plan. This local plan was combined with plans from all other California non-attainment




SOURCE: CA Environmental Protection Agency, 2010; BRG Consulting, Inc., 2010

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# Air Quality Monitoring Station Locations

FIGURE 5.3-2

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# TABLE 5.3-2
# Ambient Air Quality Summary

| Pollutant | Average Time | California Air Quality Standards | Federal Primary Standards | Highest Yearly State Measurement | | | Days Above State Standards | | | Highest Yearly National Measurement | | | Days Above National Standard | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 | 2006 | 2007 | 2008 |
| **Escondido Monitoring Station** | | | | | | | | | | | | | | | |
| Ozone | 1 hr | 0.09 ppm | N/A | **0.108** | 0.094 | **0.116** | 3 | 0 | 9 | N/A | N/A | N/A | N/A | N/A | N/A |
| | 8 hr | 0.070 ppm | 0.075 ppm | **0.097** | **0.078** | **0.099** | 11 | 5 | 23 | **0.096** | **0.077** | **0.098** | 6 | 3 | 13 |
| $PM_{10}$ | Daily | 50 μg/m³ | 150 μg/m³ | **52.0** | **68.0** | **84.0** | 1 | 2 | 1 | 51.0 | 68.0 | 82.0 | 0 | 0 | 0 |
| $PM_{2.5}$ | Daily | No separate state standard | 35 μg/m³ | 40.6 | 151.0 | 37.3 | N/A | N/A | N/A | **40.6** | **126.2** | **38.1** | 1 | 11 | 1 |
| CO | 8 hr | 9.0 ppm | 9.0 ppm | 3.61 | 3.19 | 2.81 | 0 | 0 | 0 | 3.61 | 3.19 | 2.81 | 0 | 0 | 0 |
| $NO_2$ | 1hr | | | 0.071 | 0.072 | 0.081 | 0 | 0 | 0 | N/A | N/A | N/A | N/A | N/A | N/A |
| **Camp Pendleton Monitoring Station** | | | | | | | | | | | | | | | |
| Ozone | 1 hr | 0.09 ppm | N/A | 0.086 | 0.083 | **0.104** | 0 | 0 | 1 | N/A | N/A | N/A | N/A | N/A | N/A |
| | 8 hr | 0.070 ppm | 0.075 ppm | **0.073** | **0.074** | **0.077** | 5 | 4 | 3 | 0.073 | 0.074 | **0.076** | 0 | 0 | 2 |
| Nitrogen Dioxide | 1 hr | 0.18 ppm | N/A | 0.081 | 0.068 | 0.085 | 0 | 0 | 0 | N/A | N/A | N/A | N/A | N/A | N/A |

Notes: Exceedances are bolded; N/A = Not Applicable

Source: California Air Resources Board (CARB) ADAM Ambient Air Quality Inventory, 5/05.

areas having serious ozone problems and used to create the California State Implementation Plan (SIP). The SIP was adopted by the Air Resources Board (ARB) after public hearings on November 9 through 19 in 1994, and was forwarded to the EPA for approval. After considerable analysis and debate, particularly regarding airsheds with the worst smog problems, EPA approved the SIP in mid-1996.

The RAQS accounts for current emissions associated with the proposed project, as well as previously approved projects consistent with current General Plan policies. Therefore, determining whether the proposed project is consistent with the RAQS requires a comparison of net emissions from the proposed development to the emissions associated with previously approved and accounted for plans (commonly known as the *Consistency Criterion* of the RAQS).

The proposed Dos Colinas development is consistent with future build out plans for the project site under the City's General Plan and therefore satisfies the *Consistency Criterion* of the RAQS.

## 5.3.2 Thresholds For Determining Significance

*Appendix G of the CEQA Guidelines is used to provide direction for determination of a significant air quality impact from the proposed project. For purposes of this EIR, a significant air quality impact would occur if implementation of the proposed project would:*

- *Conflict or obstruct the implementation of the San Diego Regional Air Quality Strategy (RAQS) or applicable portions of the State Implementation Plan (SIP);*
- *Result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation;*
- *Result in cumulatively considerable net increase of Particulate Matter Less than 10 Microns ($PM_{10}$) or exceed quantitative thresholds for Ozone ($O_3$) precursor, oxides of nitrogen ($NO_x$) and Volatile Organic Compounds (VOCs), since San Diego County is presently in non-attainment for the Federal and/or State Ambient Air Quality Standards for $O_3$ and $PM_{10}$;*
- *Expose sensitive receptors (schools, hospitals, resident care facilities, or day-care centers) to substantial pollutant concentrations;*
- *Create objectionable odors affecting a substantial number of people.*

The San Diego Air Pollution Control District (SDAPCD) established screening level thresholds for air quality emissions (Rules 20.1 et seq.). Applicable standards are shown quantitatively in Table 5.3-3. These standards are compatible with those utilized elsewhere in the State (such as the South Coast Air Quality Management District standards, etc.).

In addition, under the General Conformity Rule, the EPA has developed a set of thresholds for all proposed federal actions in a non-attainment area for evaluating the significance of air quality impacts. It should be noted that the State (i.e., SDAPCD) standards are equal or more stringent than the Federal Clean Air standards. Development of the proposed project would, therefore, fall under the stricter SDAPCD guidelines.

### 5.3.2.1 *Diesel Toxic Risk Thresholds*

There are inherent uncertainties in risk assessment with regard to the identification of compounds as causing cancer or other health effects in humans, the cancer potencies and Reference Exposure Levels (RELs) of compounds, and the exposure that individuals receive. It is common practice to use conservative (health protective) assumptions with respect to uncertain parameters. The uncertainties and conservative assumptions must be considered when evaluating the results of risk assessments.

TABLE 5.3-3
Thresholds of Significance for Air Quality Impacts

| **Pollutant** | **Thresholds Significance** (Pounds Per Day)[3] | **Clear Air Act** *Less than Significant Levels* (Tons Per Year) |
|---|---|---|
| Carbon Monoxide (CO) | 550 | 100 |
| Oxides of Nitrogen ($NO_x$) | 250 | 50 |
| Oxides of Sulfur ($SO_x$) | 250 | 100 |
| Particulate Matter ($PM_{10}$) | 100 | 100 |
| Particulate Matter ($PM_{2.5}$) | 55 | 100 |
| Volatile/Reactive Organic Compounds & Gasses (VOC/ROG) | 75 | 50 |

Notes -Threshold for VOCs based on the threshold of significance for reactive organic gases from Chapter 6 of the CEQA Air Quality Handbook of the South Coast Air Quality Management District.
-Thresholds are applicable for either construction or operational phases of a project action.
-The PM2.5 threshold is based upon the proposed standard identified in the, *"Final—Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds"*, published by SCAQMD in October 2006.

Source: SDAPCD Rule 1501, 20.2(d)(2), 1995; EPA 40CFR93, 1993.

There is debate as to the appropriate levels of risk assigned to diesel particulates. The USEPA has not yet declared diesel particulates as a toxic air contaminant. The SDAPCD typically applies a risk level of one in a million per microgram per cubic meter. For the purposes of the air quality analysis for the project, and to be consistent with the approaches used for other toxic pollutants, a functional comparison of the aforementioned risk probability per individual person exposed to construction contaminants will be examined.

## 5.3.3 Environmental Impact

The analysis criteria for air quality impacts are based upon the approach recommended by the South Coast Air Quality Management District's (SCAQMD) CEQA Handbook. The handbook establishes aggregate emission calculations for determining the potential significance of a proposed action. Please refer to the Air Quality Conformity Assessment provided in Appendix C1 on the attached CD located on the back cover of this EIR for a more detailed discussion of the analysis methodology.

### 5.3.3.1 *Construction Impacts*

Air emissions are generated during construction activities associated with the development of a project including rough grading, underground utility construction, and paving activities. During site grading,

tailpipe emissions are generated by construction related vehicles such as graders, bulldozers, water trucks, backhoes, rollers, loaders, rock crushing equipment, and construction worker's vehicles. Emissions are also generated in the form of dust and $PM_{10}$ as a result of soil disturbance. Construction emissions vary from day-to-day depending on the number of workers, number and types of active heavy-duty vehicles and equipment, level of activity, the prevailing meteorological conditions, and the length over which these activities occur.

### A. Grading and Site Preparation

The estimated construction equipment exhaust emissions are provided below in Table 5.3-4 for the typical construction activities identified at the project site. These emissions are shown using the baseline Tier 0 emissions inventory. The construction activities would roughly be divided into three phases: Rough Grading, Underground Utility Construction and Surface Paving.

As shown in Table 5.3-4, the proposed project would result in exceedances in oxides of nitrogen ($NO_x$) of the SDAPCD threshold during Rough Grading/Hauling. This is considered a significant impact and would require mitigation using cleaner Tier 2+ equipment and the "*Blue Sky Series*" designation[1] for scrapers to reduce ($NO_x$) emissions to below a level of significance. The proposed project would not exceed construction emissions due to Underground Utility Construction and Surface Paving. Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce this impact to a level less than significant.

### B. Earthwork Activities

Construction activities are also a source of fugitive dust emissions ($PM_{10}$, $PM_{2.5}$) that may have a substantial, but temporary, impact on local air quality. These emissions are typically associated with land clearing, excavating, and construction of a proposed action. Substantial dust emissions also occur when vehicles travel on paved and unpaved surfaces and haul trucks lose material.

Grading of the project would occur in successive phases in order to implement the project. However, for purposes of estimating air quality emissions, the construction emissions estimates are based on the assumption that the entire project site would be graded and developed in one phase. This provides a worst-case analysis of potential construction emissions for purposes of quantifying emissions in pounds per day. Initial site grading is proposed to occur on the RV storage/garden parcel of the project site. Grading of the project to support the new RV storage/garden parcel would include: 1) Placing fills for the RV area per grades pursuant to MS-09-04; 2) Borrow of on-site soil (Parcel 1) adjacent to, but outside the limits of the proposed RV parcel (Parcel 2) per grading limits shown on MS-09-04; and, 3) Grading of proposed water quality bio-retention. Immediately following, the remaining portions of the site would be graded.

[1] The "Blue Sky Series" designation [40 CFR Part 89] is a voluntary program enacted by the USEPA requiring participating engine manufacturers to produce cleaner burning engines that are at least 40% better than current Tier 2 or 3 mandates. Engines with this designation are assumed by the EPA to produce *de facto compliance* with current and future air quality emissions standards. This program also exists for recreational and commercial marine diesel engines [40 CFR Part 94] and land-based non-road spark-ignition engines over HP [40 CFR Part1048]

# TABLE 5.3-4
# Construction Equipment Emissions

| Equipment | Aggregate Emissions in Pounds/Day | | | | | |
|---|---|---|---|---|---|---|
| | CO | $NO_x$ | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | ROG |
| **Rough Grading and Earthwork Emissions*** | | | | | | |
| Dozer – D8 Cat | 21.6 | 55.2 | 4.8 | 3.6 | 3.3 | 7.2 |
| Loader | 9.0 | 13.2 | 1.2 | 0.6 | 0.6 | 1.8 |
| Water Truck | 4.8 | 16.8 | 1.6 | 1.2 | 1.1 | 1.6 |
| Dump Trucks | 11.5 | 40.3 | 3.8 | 2.9 | 2.7 | 3.8 |
| Scraper | 118.8 | 205.2 | 21.6 | 16.2 | 14.9 | 10.8 |
| **TOTAL** | **165.7** | **330.7** | **33.0** | **24.5** | **22.6** | **25.2** |
| Significance Threshold (SDAPCD) | 550 | 250 | 250 | 100 | 55 | 75 |
| Significant? | NO | **YES** | NO | NO | NO | NO |
| **Underground Utility Construction Emissions**** | | | | | | |
| Track Backhoe | 13.5 | 19.8 | 1.8 | 0.9 | 0.8 | 2.7 |
| Loader | 13.5 | 19.8 | 1.8 | 0.9 | 0.8 | 2.7 |
| Concrete Truck | 3.8 | 13.1 | 1.3 | 0.9 | 0.8 | 1.3 |
| Concrete Pump | 2.2 | 3.6 | 0.4 | 0.2 | 0.2 | 0.4 |
| Dump/Haul Trucks | 13.0 | 45.4 | 4.3 | 3.2 | 2.9 | 4.3 |
| **TOTAL** | **46.0** | **101.7** | **9.6** | **6.1** | **5.5** | **11.4** |
| Significance Threshold (SDAPCD) | 550 | 250 | 250 | 100 | 55 | 75 |
| Significant? | NO | NO | NO | NO | NO | NO |
| **Surface Paving Activities***** | | | | | | |
| Skid Steer Cat | 13.5 | 19.8 | 1.8 | 0.9 | 0.8 | 2.7 |
| Dump/Haul Trucks | 12.2 | 42.5 | 4.1 | 3.0 | 2.8 | 4.1 |
| Paver | 5.9 | 19.3 | 1.7 | 0.8 | 0.7 | 0.8 |
| Roller | 5.9 | 16.8 | 1.7 | 0.8 | 0.7 | 1.7 |
| **TOTAL** | **37.5** | **98.4** | **9.3** | **5.5** | **5.0** | **9.3** |
| Significance Threshold (SDAPCD) | 550 | 250 | 250 | 100 | 55 | 75 |
| Significant? | NO | NO | NO | NO | NO | NO |

Source: ISE, 2009.

Notes:
* = Rough Grading Activities include clearing, grubbing, and general pad and road alignment formation. This typically consists of three distinct phases: mobilization, scraper hauls/finishing, and additional site finishing work. These emissions are for vehicle operations only.

** = Utility Construction includes general trench-work, pipe laying with associated base material and cover, and ancillary earthwork required to facilitate placement of sewer lift stations, manholes, etc. This is typically performed as a single phase.

*** =Paving Activities would include the movement of any remaining material as well as necessary curb and gutter work, road base material placement and blacktop. This is typically performed as a single phase.

**The construction emissions estimates are based on the assumption that the entire project site would be graded and developed in one phase. This provides a worst-case analysis of potential construction emissions for purposes of quantifying emissions in pounds per day.**

Construction grading operations at the proposed Dos Colinas development are anticipated to be a balanced 793,670 cubic-yards of material moved over an anticipated 180-day earthwork period. This includes all phases of project grading. For alluvium-type material, the project would have a total working weight of 591,500 tons. It is estimated that roughly 75 percent of the working weight would be capable of generating $PM_{10}$ due to the presence of hard rock and non-alluvium conditions. Thus, the working weight of earthwork material capable of generating some amount of $PM_{10}$ would be 443,625 tons. The average mass grading earthwork movement per day over the total 180 working days would be 2,464.6 tons/day. Surface wetting will be utilized during all phases of earthwork operations at a level of three times per day, which would reduce the amount of fugitive dust. Assuming the aforementioned watering yields, the total fugitive dust generated load would be reduced to approximately 63.3 pounds per day. This level is below the 100 pounds per day threshold established by SDAPCD. $PM_{2.5}$ emissions of 13.2 pounds per day fall below the SDAPCD threshold of 55 pounds per day. Therefore, no impacts are expected from the site grading phase of construction.

Unpaved road travel due to construction activities is unknown at this time. For the purpose of the analysis, it will be assumed that contractors' vehicles moving onsite would traverse a total of 50 miles per day during the 180 days of earthwork and preparation of the project site. It is calculated that approximately 23.1 pounds of $PM_{10}$ and 4.9 pounds of $PM_{2.5}$ would be generated per day. As stated above, these are below the proposed threshold of significance established by SDAPCD.

### C. Diesel Related Toxic Emissions

The proposed Dos Colinas project has a maximum working area of roughly 2,134,440 square-feet based upon data obtained from the project site plans (including 1st and 2nd phase development). Based upon the construction equipment emission levels identified in Table 5.3-4, the expected diesel-fired construction emission concentrations, based on the *SCREEN3* modeling, are shown in Table 5.3-5. The *SCREEN3* methodology essentially applies to all of the diesel emissions over the project site and provides a worst-case assessment of the potential impacts to sensitive receptors. Although all stable criteria pollutants are provided, it should be noted that for cancer-risk potential, only $PM_{10}$ is the single contributing factor. A detailed modeling methodology is provided in Appendix C1 on the attached CD of Technical Appendices found on the back cover of this EIR. Based upon the model results, all criteria pollutants are estimated to be below the SDAPCD-recommended level of one in a million per $\mu g/m^3$ (i.e., all risk levels less than 1.0). Therefore, no significant impact associated with diesel-related toxic emissions is anticipated.

## *5.3.3.2 Operation Impacts*

### A. Vehicular Emission Levels

Motor vehicles are the primary source of air emissions associated with the proposed project. Typically, uses such as the proposed project do not directly emit significant amounts of air pollutants from on-site activities. Rather, vehicular trips to and from these land uses are the significant contributor.

# TABLE 5.3-5
## *SCREEN3* Predicted Diesel-Fired Emission Concentrations

| Criteria Pollutant | Pollutant Concentration ($\mu g/m^3$) | Pollutant Concentration (ppm) | Pollutant Risk Probability (percent risk per person for 70-year exposure) | California Air Quality Standards (Thresholds of Significance) | Significant? |
|---|---|---|---|---|---|
| CO | 70.34 | 0.0612 | N/A | 9.0 ppm | No |
| $NO_x$ | 116.40 | 0.0619 | N/A | 0.18 ppm | No |
| $SO_x$ | 24.26 | 0.0096 | N/A | 0.25 ppm | No |
| $PM_{10}$ | 2.79 | - | 0.084% | 50 $\mu g/m^3$ | No |
| $PM_{2.5}$ | 2.57 | - | N/A | 35 $\mu g/m^3$ | No |

Notes: Diesel risk calculation based upon ARB 1999 Staff Report from the Scientific Review Panel (SRP) on Diesel Toxics inhaled in a 70-year lifetime.

Conversion Factors (approximate):

- CO: 1ppm = 1,150 ug/$m^3$ @ 25 deg-C STP
- $NO_x$: 1ppm = 1,880 ug/$m^3$ @ 25 deg-C STP
- $SO_x$: 1ppm = 2,620 ug/$m^3$ @ 25 deg-C STP
- $PM_{10}$: 1ppm = 1 g/$m^3$ (solid)
- $PM_{2.5}$ levels based upon the CEIDARS database fractional emission factor for diesel construction equipment of 0.920 $PM_{2.5}$ / $PM_{10}$.

$PM_{2.5}$ levels based upon the CEIDARS database fractional emission factor for diesel construction equipment of 0.920 $PM_{2.5}$ / $PM_{10}$.

Source: ISE, 2009.

The project is estimated to have a total worst-case trip generation level of 1,340 average daily trips (ADTs) based upon the cumulative trips generation produced for the proposed project. The project site is primarily vacant and undeveloped land. These existing land uses generate minimal ADTs and associated vehicular emissions. Table 5.3-6 provides the estimated vehicular pollutant emission levels at buildout of the proposed project. Based upon the findings, the Dos Colinas project would not exceed the thresholds established by the SDAPCD. Therefore, daily mobile source emissions associated from the proposed project is not significant.

### B. Sensitive Receptors/CO "Hotspots"

Development of the proposed project does not have the potential to increase the exposure of sensitive receptors to carbon monoxide (CO) levels in excess of state and federal standards and is not considered to be a primary concern. CO hotspots typically occur in areas where vehicles idle and/or when wind speeds are low. These hotspots occur mostly in the early morning hours when winds are stagnant, temperatures are relatively low, and ambient CO concentrations are elevated.

The South Coast Air Quality Management District's California LINE Source Dispersion Model, version 4 (Caline 4) was used to predict CO emissions at 100 feet from the road centerline or roadways, during the predicted peak hour traffic volume for the cumulative build out plus project scenario. The results of the analysis indicate that no localized criteria pollutant impacts would create a CO "hotspot." The roadway segments examined were found to comply with the CAAQS and NAAQS standards, as depicted in Table 5.3-7. Therefore, project generated traffic would not contribute toward a CO "hotspot" impact.

# TABLE 5.3-6
## Projected Mobile Emissions

| Vehicle Type | ADT | Aggregate Trip Emissions in Pounds/Day | | | | | |
|---|---|---|---|---|---|---|---|
| | | CO | $NO_X$ | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | ROG |
| Light Duty Autos | 918 | 17.87 | 2.36 | 0.03 | 0.08 | 0.1 | 0.49 |
| Light Duty Trucks | 258 | 6.37 | 1.02 | 0.01 | 0.05 | 0.1 | 0.14 |
| Medium Duty Trucks | 85 | 2.36 | 0.70 | 0.00 | 0.02 | 0.0 | 0.08 |
| Heavy Duty Trucks | 63 | 2.33 | 5.55 | 0.01 | 0.17 | 0.2 | 0.25 |
| Buses | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 |
| Motorcycles | 7 | 2.05 | 0.11 | 0.00 | 0.00 | 0.0 | 0.19 |
| **TOTAL** | **1,330** | **31.0** | **9.7** | **0.1** | **0.3** | **0.3** | **1.1** |
| Significance Threshold (SDAPCD) | | 550 | 250 | 250 | 100 | 55 | 75 |
| Significant? | | NO | NO | NO | NO | NO | NO |

Notes: Assumes a 5-mile trip distance per vehicle. SDAPCD air basin. Wintertime conditions (50° F). For operational traffic, the fractional emissions factor is 0.998 $PM_{2.5}/PM_{10}$.
Source: ISE, 2009.

# TABLE 5.3-7
## CALINE4 Dispersion Results- $CO/NO_x/PM_{10}/PM_{2.5}$

| Roadway | Segment | LOS | ADT | CO (ppm) |
|---|---|---|---|---|
| El Camino Real | Tamarack Avenue to Cannon Road | A | 35,150 | 1.3 |
| | Cannon Road to College Boulevard | A | 39,280 | 1.3 |
| | College Boulevard to Faraday Avenue | C | 36,100 | 1.3 |
| | Palomar Airport Road to Camino Vida Roble | A | 35,070 | 1.3 |
| Cannon Road | Faraday Avenue to El Camino Real | A | 13,110 | 1.1 |
| | El Camino Real to College Boulevard | B | 18,840 | 1.2 |
| College Boulevard | Faraday Avenue to El Camino Real | A | 12,140 | 1.1 |
| | El Camino Real to Cannon Road | A | 23,800 | 1.2 |
| | | | Significance Threshold (NAAQS) | 9.0 ppm |
| | | | Significance Threshold (CAAQS) | 9.0 ppm |
| | | | **Significant?** | **NO** |

Source: ISE, 2009.

### C. Odor

The inhalation of volatile organic compounds (VOCs) causes smell sensations in humans. There are four primary ways in which these odors can affect human health:

- VOCs can produce toxicological effects;
- The odorant compounds can cause irritations in the eye, nose, and throat;
- VOCs can stimulate sensory nerves that can cause potentially harmful health effects; and,
- The exposure to perceived unpleasant odors can stimulate negative cognitive and emotional responses based on previous experiences with such odors.

Development of the proposed project site could generate trace amounts (less than 1 $\mu g/m^3$) of substances such as ammonia, carbon dioxide, hydrogen sulfide, methane, dust, organic dust, and endotoxins. Additionally, proposed on-site uses could generate such substances as volatile organic acids, alcohols, sulfides, and fixed gases. Odor generation impacts due to the project are not expected to be significant since any odor generation would be intermittent and would terminate upon completion of the construction phase of the project. As a result, no significant air quality impacts are expected to surrounding residential receptors.

### D. Fixed Source Emissions

Fixed source emissions within the project site would consist entirely of small gasoline engines used with lawn mowers and landscaping equipment as well as emissive sources from natural gas powered appliances, such as hot water heaters and stoves. Due to the nature of the project, delivery trucks are anticipated to travel to and from the project site. Approximately two to five deliveries would occur throughout the day, which could potentially result in truck idling. The delivery truck trips have been accounted for in the project's total trip generation and emissions. Specific idling associated with truck trips would not result in an exceedance of any air quality standard.

For the purposes of analysis, residential dwelling units within the facility would be functionally equivalent to a multifamily use as defined by CARB. Ancillary uses such as kitchen and laundry areas, woodworking shops, etc. would fall within the retail classification from an emissions standpoint. Small gasoline engine emissions, natural gas emissions, and emissions from delivery trucks fall below thresholds of significance, and therefore would not generate an air quality impact.

## *5.3.3.3 Air Quality Management Plan*

Section 15125(B) of the State CEQA Guidelines contains specific reference to the need to evaluate any inconsistencies between the proposed project and the applicable air quality management plan. The Regional Air Quality Strategies (RAQS) plan set forth the steps needed to accomplish attainment of state and federal ambient air quality standards. The CARB provides criteria for determining whether a project conforms with the RAQS which include the following:

- Is a regional air quality plan being implemented in the project area?
- Is the plan consistent with the growth assumptions in the regional air quality plan?
- Does the project incorporate all feasible and available air quality control measures?

The project area is located within the San Diego Air Basin, and as such, is located in an area where a regional air quality plan is being implemented. The project would require a General Plan Amendment for implementation; however, the project is consistent with the growth assumptions within Local Facilities Management Zone 15 of the City. Furthermore, an Air Quality Conformity assessment has been prepared for the project (ISE, 2009) and no significant, long-term air quality impact has been identified.

## 5.3.4 Mitigation Measures

### A. Short-term Construction Impacts

Mitigation Measures AQ-1 and AQ-2 have been shown by the California Air Resources Board (CARB) to be effective in reducing NOx and diesel particulate emissions. Proper implementation of these measures through Best Available Control Technology (BACT) is expected to reduce emissions to below a level of significance.

**AQ-1** Construction equipment shall be equipped with an engine designation of EPA Tier 2 or better Tier (Tier 2+). A list of the construction equipment and the associated EPA Tier shall be submitted to the City Planning Department prior to issuance of a grading permit.

**AQ-2** All scraper equipment shall meet the *"Blue Sky Series"* equivalent standard. The "Blue Sky Series" designation (40 CFR Part 89) is a voluntary program enacted by the USEPA requiring participating engine manufactures to produce cleaner burning engines that are at least 40% better than the current Tier 2 or 3 mandates. This measure would require the use of scraper equipment that meets this standard (or equivalent).

These standards are specific below:

- The maximum CO emissions from Tier 2 equipment is 0.0082 pounds per horsepower-hour (lb/HP-hr) for equipment with power ratings between 50 and 175 HP, and 0.0057 lb/HP-hr for equipment with power ratings over 175 HP. Tier 3 ratings only apply between 50 to 750 HP and are identical to Tier 2 requirements. Tier 4 requirements (to be phased-in between 2008 and 2015) set a sliding scale on CO limits ranging from 0.0132 lb/HP-hr for small engines, to 0.0057 lb/HP-hr for engines up to 750 HP.

- The maximum NOx and PM10 emissions from Tier 2 equipment are 0.0152 and 0.0003 lb/HP-hr regardless of the engine size. Tier 3 emissions were either not adopted or must meet the Tier 2 requirement. Tier 4 standards further reduce this level to 0.0006 lb/HP-hr for NO, and 0.00003 lb/HP-hr for PM for engines over 75 HP.

A list of the scraper equipment and the associated EPA Tier (Blue Sky Series or equivalent) shall be submitted to the City Planning Department prior to issuance of a grading permit.

**B. Long-term Operational Impacts**

No long-term operational impacts are identified. Therefore, no mitigation is required.

## 5.3.5 Impact After Mitigation

Implementation of Mitigation Measures AQ-1 and AQ-2 would reduce the short-term construction related air quality impact to a level less than significant. No significant long-term operational air quality impacts have been identified.

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